ACRO SPORT Newsletter

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Edited by: Chris Kinnaman

John's Pober Pixie at his home field - Blue Knob Valley airport.

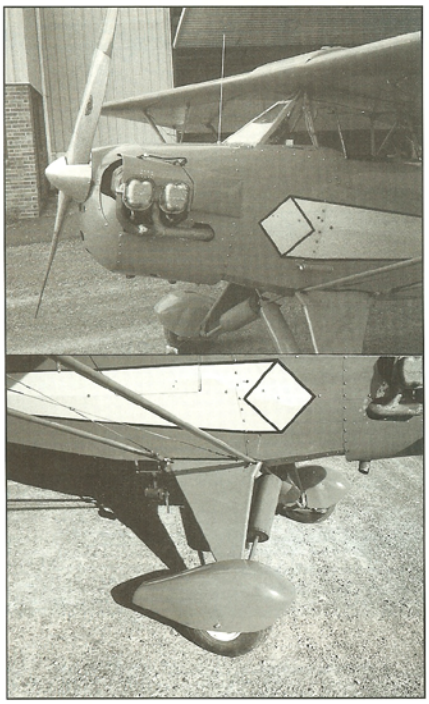
John Leitis and His Pober Pixie N81JL

by M. John Leitis,
817 Roosevelt Ave,
Roaring Spring, PA 16673-1908

I always wanted to build an airplane, and that dream came true in 1978. That year I bought a set of plans for the Pober Pixie from Acro Sport. In fact, I visited EAA's Oskosh convention for several years in an effort to decide what kind and what type of an aircraft I wanted to build. I am 6 feet tall and 200 pounds.

A steel tube and wood wing, fabric covered airplane was desirable. I did not want an aerobatic plane since I had access to a Citabria at our field. I wanted to build a dependable low-cost aircraft and after looking over a lot of aircraft the Pober Pixie pleased me, and knowing Paul Poberezny is about my size, if he can fit in a Pixie so will I. In November 1978 I started to cut my first piece of metal. 24 months and many phone calls to Ben Owen and Bill Chomo, and 3 FAA inspections later, I test flew my Pober Pixie, N81JL, on November 4, 1980.

What a thrill! I flew 45 minutes before landing. It flew nearly perfect. I needed only one turn on the right wing strut clevis to eliminate the heavy right wing. By March 1981 I had completed my required 25 hours and received my Airworthiness Certificate. I did not get to fly to Oshkosh that year due to engine overheating problems and a major overhaul on the Pixie's



Top – Note fairings aft of the A-75's cylinders, also the blended nose bowl shape to match the new 10" spinner. Above – A close look a the widened wheel pants – and a challenging design exercise to accommodate the necessary mounting brackets.

Continental A-75. Overhaul was completed in September, thus my first flight to Oshkosh was in 1982. Landing on Oshkosh Wittman Field's EAA convention was my second largest thrill. After all I was one of 10,000 homebuilders in the world to build and fly a homebuilt airplane.

Thanks to Paul Poberezney, Acro Sport, and all the other people for designing a very good, dependable, trouble free airplane. Also thanks to Bill Blake for excellent drawings. In 19 years and 1012 hours this aircraft has trouble free, as has the engine.

During the 19 years I did some minor modifications. I had the fuel tank enlarged to 16 gallons which was approved by the FAA. I closed the sides of the cockpit area, closed the gaps between the horizintal and vertical tail surfaces. All this increased the cruise speed to 93 mph.

Spring 1999 I decided to dress up my Pixie and I bought, modified and installed a set of wheel pants. Modification to the wheel pants consisted of splitting them in half and widening them by two inches. The pants I had bought were for 6 X 600 low profile tires but my Pixie has standard tires and the pants wouldn't fit over the wheels at all. Since the wheel pants were bought and paid for, modification was the choice. This taught me a lot about fiberglass work. A good friend, Herb Rutter, a Long Eze builder and, like me, a technical counselor, gave me a lot of pointers and good advice. Everything came out very well and provided me with a lot of training and experience in fiberglass construction. Mounting the wheel pants require some challenging design work. Since my Pixie did not have the necessary brackets welded on the outer half of the axle as shown on the plans, and not wanting to dismantle the landing gear for attaching the needed brackets, I fabricated brackets which are bolted to the axle with the brake assembly, the brackets and a 10"X1/4"X1" bar attached to it to provide good solid support for the wheel pants. On the axle's outer end I bought special wheel nuts like the ones that are used on Citabrias. These nuts have an extended 1/4"X28 threaded bushing as an intergral part. This provides a very solid mounting.

Also I bought and installed a 10" prop spinner, which required a modification to the nose bowl in order to match the spinner. Everything looks great, but none of this increased the cruise speed. Well, none was expected, but those two additions change the appearence quite a bit. For better, I hope.

The next project will be the installation of an electric start engine. The reason is for safety. At some airports it is getting very hard to find a qualified person who knows how to hand prop an engine. I am not sure what type of engine I will use. The Continential A-75

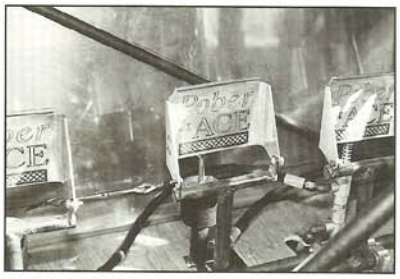
The Pixie shows off its 1930's appearance. Note the center section fuel tank.

had been very dependable and the closest to this, the Continental C-85, is hard to find. There are a few other choices in 4-cycle powerplants, some are very recently developed and some have been around for some time, I will be looking around a lot in an effort to find good dependable power like my 75 hp Continental has been in the past.

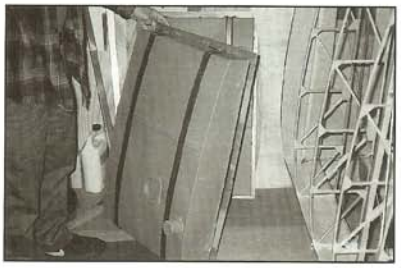
That, and with many other interests in aircraft building, restoring, modification, etc. the Airventure at Oshkosh will provide a lot of information.

(Editor's note: With 1000+ hours on his Pixie, John will be parking it with homebuilts with similar hours in a place near the Homebuilders' HQ. John can be found instructing interested builders in the art of welding in the workshop area at Airventure.)

The larger 16 gas tank projects slightly above the wing airfoil.



Above – Ken's Junior Ace features dual controls and these fancy brake pedals. Left – Fuselage ready for covering. Below – Fuel tank completed and about to be installed in the wing.



Letters

Oshkosh '99 From Ken Terrio

Ken Terrio has been demonstrating various phases of constructing a Junior Ace in the wood workshops at AirVenture over the last few years as well as building his own Junior Ace. His updates to both are as follows, from a letter to Paul Poberezny:

Dear Paul,

When it came time to renew our SAA membership I realized I was delinquent with my Oshkosh report, so here is it:

As in the past, it was a pleasure to work with George Applebay. The wing building project provided fewer opportunities for us to offer "hands on training" but we did build some ribs and introduce a few new builders to the art.

The B-2 pilot did not return but I did work with a King Air corporate pilot and a teenage girl who was so excited about building her own airplane she couldn't wait to get back home and get started. Her bubbly exuberance was infectious and brought a smile to everyone's face.

There was no end to the interesting people who stopped by. This year I was honored to meet and chat with a B-24 pilot who flew the Ploesti mission. He was one of the many who stopped by to watch, ask questions and learn.

The highlight of the meet for me was the Trimotor ride arranged by you. Being a collector of 1937 Fords and Ford affectionate it's always a thrill to fly in a Trimotor, but to sit in the right seat and actually fly the airplane was the ultimate experience, an experience for which I shall always be grateful. When George Applebay got off the plane he had a smile on his face and a spring in his step which prompted me to tell him

"I saw an old man climb aboard the plane and a young boy get off."

On a new/old subject, it was a pleasant surprise to see the article on our ("our" is my wife and I) Junior Ace in the TO FLY magazine. Our grandchildren were particularly impressed.

Last week I finished what I call the construction phase. The only major items left are the engine hookups, covering and instrument installation. I thought you might find the brake pedals interesting so I've enclosed a photo of them along with one of our 1937 Ford pick-ups.

In closing, I would again like to offer my services to help you with any of your projects during Oshkosh 2000.

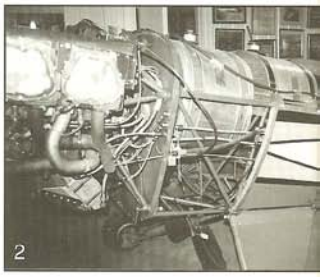
Sincerely,
Ken Terrio
1129 Killingworth Road
Higganum, CT 06441

These springs and the upholstering that follows should make these seats very comfortable for any future cross country flights. Plenty of room for two in this cockpit.

1

Super Acro Sport Restored

The prototype Super Acro Sport N5AC, which has been on display outside the Poly Fiber (and before that, Stits) Acro Sport tent at Oshkosh over the years, has undergone an extensive restoration. Gary Buettner did the majority of the work, and Paul Poberezny reports that he has done an excellent job.



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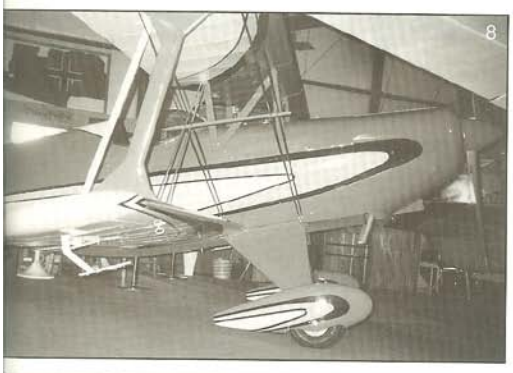
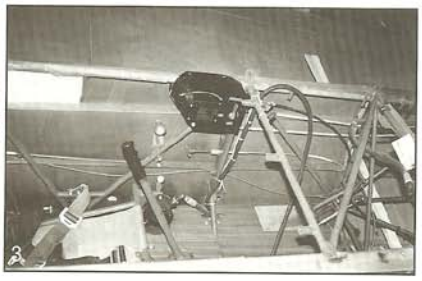
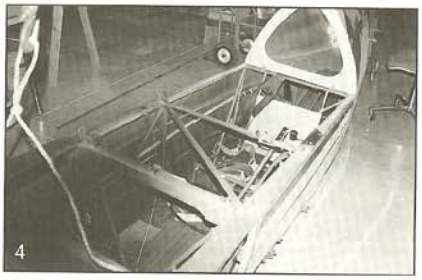


1. Completed and ready to roll out of the shop and go flying.
2. Disassembly begins prior to resoration.
3. Cockpit area during restoration.
4. The cockpit area in need of a face-lift after many years of aerobatic flying.
5. The beautifully restored Acro Sport.
6. In the paint shop – overall blue at this stage.
7. Assembly after completing the distictive Acro Sport paint scheme.
8. Ready for test flight after full restoration. Note spades on lower ailron.
9. Complete, except for ailron hookups.





Stabilizer Hints & Learning Experience

By David Hintenlang, Ph.D., 12691 NE 131 Place, Archer, FL 32618

Like many builders, I chose to start with the tail feathers for the first metal work on my Acro II, and thus had built the stabilizer assembly some time ago. Since then my fuselage assembly has been coming along, finally arriving at the stage where the stabilizer needs to be mounted on the fuselage. As I usually do prior to starting a new phase of work, I dutifully reviewed the plans and concluded that the installation looked straightforward. As it turns out this fabrication has a lot more pitfalls than I originally thought. Since I don't recall seeing much written on this subject I thought I would jot down a few notes of my learning experiences during this phase of construction and share them with anyone who may be following me in construction. Perhaps these observations will flatten the learning curve for some other folks.

1. Front Stabilizer Mount – The fabrication of the front stabilizer mount is pretty simple and straightforward. This was the first step that I did and it went quite smoothly.

2. Rear Stabilizer Mount – There are several items of interest and complications that can arise regarding installing the rear stabilizer mounting tabs. These are the mounting tabs that hold the rear carry-through spar. These mounting tabs have a 90 degree bend at the rear edge. The bend is necessary to provide clearance for the elevator spars which pass immediately behind these mounting tabs. There is not much clearance here and if the rear stab carry-through spar holes in the tabs are not drilled close to the bend on the tab there will be a conflict with the elevator spars. Suffice to say the second set that I made worked much better then the first!

When positioning these tabs for welding it is a good idea to angle the tops inward to accommodate the shape of the fuselage as it blends with the vertical fin. If these tabs are not angled inward the tops will want to protrude through the inspection cover if the cover is installed per the plans.

Once the tabs are positioned where you like them it's time to weld them in place. To ensure that both front and rear stabilizer spars would line up with the mounting tubes I completed the front stab mounting assembly and then slid the stabilizers into place on both left and right sides. Then I tacked the tabs in place and removed the stabs for final welding. It would have been better to do all of the final welding with the stabs in place since one tab moved just enough that I couldn't get the spars on the mounts very well and had to cut it off and re-weld it.

3. Angle of incidence of the stabilizer – Okay, so this is one issue about which much has been written. The bottom line seems to be that each plane is probably going to be different and will more than likely need to be adjusted during the test flight period. I believe that you should however try to get the original installation in the right ballpark so that your adjustments are minimal. Since the angle of incidence is adjusted by adding or removing washers under the front stab spar there is quite a bit of adjustment possible at this point. Note however that raising or lowering the front spar puts a twisting moment on the rear spar. If the rear spar mounting bolts are not in place the spar is free to rotate on the mounting tube. If they are installed this twisting puts a shear load on the bolts. Thus it is best to get the angle of incidence close to where it should be prior to drilling the mounting holes

in the rear spar.

So the next question is: What should the angle of incidence be? There seems to be some ambiguity in the plans regarding the measurement required to set the angle of incidence. Current plans specify establishing the horizontal stab incidence "1/2 in. leading edge up to top longeron" – but doesn't show exactly where the 1/2 in. is measured. This has been variously interpreted as the distance between the top longeron and the bottom of the leading edge, or the center of longeron to center of leading edge, or some other variation. Note that these measurements refer to the stabilizer leading edge and not the position of the front spar. In a previous newsletter, Ben Owen has suggested that in an ideal situation the incidence of the wings and the incidence of the horizontal stabilizer would be the same for an aerobatic airplane so it would fly reasonably the same upright or inverted. So perhaps the best advise is to keep the wing and stab angles of incidence close to each other, then fine tune the stab incidence during flight testing until the elevator lies straight in trail during level cruising flight.

4. Drilling the mounting bolt holes – Once the angle of incidence is approximately set there are still a couple more adjustments to be made before drilling the mounting holes. You will want to get the left and right sides of the stabilizer aligned with each other. This will be fine tuned during the final rigging, but again you want it reasonably close to avoid putting undue stress on the spars or the mounting brackets. In my case I leveled the fuselage and then placed a long length of angle iron across the stab with a level on top of that, then jacked up both tips of the stab until it was straight and level. Finally check the rear spars are aligned using a piece of tubing or a taut string. It may be necessary to move the tips fowards or back a bit to get this lined up. Failure to align the rear spars will prevent the elevator spars from aligning at the center, which is necessary to accommodate the bearing and control horns.

5. Elevator Bearing Bracket – One last idea. When it comes time to work on the bearing mounting bracket that gets welded to the rear stab spar you will undoubtedly trim it so it fits well, i.e. the Fafnir KP-4 bearings line up and nicely slide into each elevator half, while the front of the mount matches to the rear stabilizer mounting tube. Of course if you're gas welding you probably don't expect to find it to still be lined up when you're done welding unless you've welded, or at least solidly tacked it, with everything in position. You also don't want to burn up your nice (i.e. expensive) bearings. I got a bunch of hardware store variety washers that are the same diameter and just used a stack of them bolted to the mounting bracket to simulate the bearing and keep everything aligned during the welding process.

Well, this pretty much summarizes my recent rash of learning experiences. It's now time to get back to the shop and on to more recreational and educational opportunities in aircraft construction!

Forums at AirVenture 2000

Forum times for Acro Sport designs at AirVenture 2000 will be as follows: Pober Pixie, Junior Ace, Super Ace, Nesmith Cougar: 10:00 AM - 11:15 AM, Friday, July 28, 2000. John Leitis, Pober Pixie builder and pilot, will be the moderator for this discussion. John has over 1000 hours on his Pixie and once again will present his valuable insights. The forum will be held indoors this year, in Forum Building #1. Acro Sport and Acro II: 10:00 AM - 11:15 AM, Saturday, July 29, 2000. Don Baker will lead the discussion, joined by a panel of experts. Don flies aerobatic performances in his Acro II and has written many articles describing how he approaches each particular maneuver. This forum will also be held indoors in Forum Building 1, quite a difference from last year's open-air discussion.

Wanted:

Pober Super Ace abandoned project, materials or unused kits. Alan Arrow, 3102 Douglas Street, St. Joseph, MO 64506-2321.

The Acro II remains one of today's most popular 2-place biplanes available to homebuilders. Little wonder! It has great performance, looks great, is easy to fly and land – and is not complicated to build.

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